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Abstract

Dutch disease is a condition whereby a booming export sector along with a concomitant strengthening of the non-tradable sector cause a deterioration in the rest of the tradable sector. Regression analysis finds that Dutch disease due to international remittances appears to afflict the developing countries more than the upper income countries. Developing countries, however, can inoculate their economies with policies that strengthen the domestic economy and facilitate structural change to keep the disease from setting in.

Keywords: Dutch disease; international remittances

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1. Introduction

International remittances have steadily increased to reach levels that cannot remain unnoticed. Data from the World Bank indeed show that total international remittances reached US$131 billion in 2000 from US$2 billion in 1970. The figure in 2011 is expected to exceed US$460 billion despite a drawn out global economic crisis. Data also indicate that, in recent periods, the developing countries take more than 70% of the total amount to exceed the combined receipts of direct foreign investments and foreign aid.

The new status of international remittances in the economy has stimulated research. Studies find that, at

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least at the personal or household level, international remittances make increases in consumption and welfare possible even within the poor societies. At the macroeconomy level, international remittances allow increases in disposable incomes and help fuel economic expansion and, in some cases, buoy the economy away from balance of payments problems. But one issue remains controversial: *Do international remittances cause Dutch disease?* The extant literature indicates an affirmative answer (c.f., Amuedo-Dorantes and Pozo, 2004; Bourdet and Falck, 2006; Lartney et al., 2008; Bayangos and Jensen 2011). This paper takes the same view, but it also argues that Dutch disease can be preempted from setting in, if not reversed once it is detected, with the judicious use of policies to support the expansion of production and strengthening of external competitiveness.

Following the introduction, Part 2 describes the Dutch disease, the variant of Dutch disease in the context of international remittances and the regression model. Part 3 discusses the results. The last part concludes.

2. Diagnosing Dutch disease

Consider first an economy comprised of two sectors: trading sector and non-trading sector. The trading sector produces to export, but the non-trading sector produces for domestic consumption. Corden (1984) and Corden and Neary (1982) split the trading sector into a booming export sector and the rest of the export sector.

Next, suppose there are surges in capital inflows because of a boom in the export sector. Shifts in commodities spending in favor of the non-trading sector and movements of resources away from the rest of the export sector in favor of the non-trading sector occur. Even if the capital inflows take various forms, the result is the same: the rest of the export sector is ruined as the non-trading sector flourishes.

The model posits that the shifts in spending and resources are mediated by appreciations in the real

exchange rate. With regards to the spending effect, increased incomes following a boom in the export sector increase the demand for both tradable and non-tradable commodities. Such an increase in demand exerts pressure on the prices of non-tradable commodities, which induces an appreciation of the real exchange rate that adversely affects the rest of the export sector as commodities become less competitive in the international market. Stability is achieved with resources shifting away from the rest of the export sector in favor of the non-trading sector.

The process is straightforward in terms of the resource movement effects. The expansion in the booming export sector increases the demand for its factor inputs, which siphons factor inputs from both the rest of the export sector and the non-trading sector. Subsequently, the decrease in the supply of non-tradable commodities increases the price of those commodities and encourages economic production. The responses thus draw resources away from the rest of the export sector. Ultimately, the deployment of resources in the rest of the export sector declines as resources are shifted toward the non-trading sector.

The basic Dutch disease model described above applies to the case of international remittances, too. What needs to be stressed, however, is that the booming sector represented by the deployment of workers abroad is not anything like the traditional booming sector of exported goods and services because workers are not exactly produced like the conventional commodities (c.f., Sweezy 1949). If so, prices and real exchange rates really do not have an effect on the deployment of workers abroad in the same way that they affect the export of goods and services. Still, international remittances affect macroeconomy and structural change in the country.

The model in this paper begins with the standard two sectors setup. Here, the tradable sector (TT) is the total value of exported goods and services, while the non-tradable sector (NT) is the total of consumption expenditures plus gross capital formation but *net* of the total of exported and imported goods and services. Together, they represent total production of an economy at time t as measured by the gross domestic

product (GDP). Adding up the relative shares to GDP means

$$STT + SNT = 1, \quad (1)$$

where SST is the share of the tradable sector to GDP and SNT is the share of non-tradable sector to GDP. Taking the logarithm of Equation 1, obtains

$$log(STT + SNT) = 0, \quad (2)$$

which means that the shares of the two sectors are inversely related to each other but they can still grow at positive rates.

For the regression analysis, a reduced model is specified as

$$log(TT_i) = \alpha_i + \beta\, REM + \gamma_i \boldsymbol{X} + \theta_i \boldsymbol{Z} + e_i, \quad (3)$$

where REM is international remittances; **X** is a vector of macroeconomy indicators, and **Z** is a vector of structural change indicators. The claim of the paper is that $\beta < 0$ confirms Dutch disease. The variables used in the regressions are described in turn.[1]

Macroeconomy Policies, X

Indicators are used to represent four dimensions of macroeconomy policy: fiscal, monetary, exchange rate, and trade. Fiscal policy is the share of public sector spending to GDP to a proxy for government participation in the economy. Obviously, well designed government spending supports economic expansion. It goes without saying that uncontrolled spending is detrimental to long-term economic sustainability. But if spending is restricted because of fiscal consolidation and other related contractionary measures, government participation is diluted to make fiscal policy ineffective against Dutch disease. The claim of the paper is that fiscal policy can have a positive or negative effect on the tradable sector.

The proxy for monetary policy is inflation. Monetary policy has to complement fiscal policy and it needs

[1] See Beja (2009) for a discussion on indicators for analyzing various dimensions of economic openness.

to respond to demand expansions in order to quell unnecessary inflationary pressures. Evidently, loose monetary policy is not helpful for long-term economic expansion. Still, (quasi) inflation targeting limits the efficacy of fiscal policy. And so raising interest rates to control economic expansion, aggressive sterilization of funds to manage inflation, and other measures can turn out to be anti-growth and result in some unutilized or underutilized resources that discourage domestic investments for economic production. Restrictive monetary policy may turn out to be the problem rather than the Dutch disease. Like fiscal policy, the claim here is that monetary policy can have a positive or negative effect on the tradable sector.

Exchange rate policy is represented by the share of international reserves to GDP. Often, currency management aimed at avoiding drastic currency appreciation manifests in the form of large increases in international reserves. Like restrictive monetary policy, excessive reserves accumulation can turn out to be anti-growth. In light of the recent spate of capital crises, governments have assumed a defensive stance to build up enough reserves in preparation for potential speculative attacks on their respective economies. In addition, many governments have become hesitant in using capital inflows to carry out real resource transfers because of inflation phobia. As a consequence, the macroeconomy setting becomes susceptible to Dutch disease. As with the earlier indicators, exchange rate policy can have positive or negative effect on the tradable sector.

Trade policy is represented by the share of total imports of goods and services to GDP. It is a proxy for trade openness. In the context of the macroeconomy, importation is one way to ease relative scarcities that constrain production and domestic consumption.[2] Importation can facilitate technological diffusion and adaptation, too (Lucas, 2009). As such, the complementarities between importation and the tradable sector help reverse the Dutch disease. The claim of the paper is that trade policy has a positive effect on the tradable sector.

[2] Imports can satisfy the demand for commodities in the short run, but domestic production needs to expand in the medium or long run. Prices of tradable commodities are determined by the international market.

Structural Change, Z

There are three measures of structural change: labor, industrial, and financial capacities. Labor capacity is the inverse of labor productivity, namely: the ratio of the labor force to GDP. First, increasing labor productivity is expected to release labor from economic production. But limited development or economic stagnation translates into low labor demand and that, too, releases labor from economic production. Either process does not imply that Dutch disease is in play. How well labor is reallocated to enhance sectoral production indicates the strength of sectoral capacity. The claim of the paper is that labor capacity has a positive effect on the tradable sector.

Industrial capacity means the depth of the production sectors. Its proxy is the share of total value added of agriculture and industry to GDP. Structural transformation means that development is generating reallocations of resources across sectors. Such changes do not mean Dutch disease is in play because they emerge along with the changes in the structure of production. Thus the claim of the paper is that structural transformation has a positive effect on the tradable sector.

The proxy for financial capacity is the share of total credit to GDP. It basically represents financial intermediation by the monetary authorities and banking sector as a whole. Financial intermediation brings about effective allocation of internal and/or external funds in support of sectoral production. Accordingly, greater financial depth brings about greater financial intermediation and fuels economic expansion. The claim of the paper is that financial capacity has a positive effect on the tradable sector.

Data and Empirical Strategy

The top 20 international remittance-recipient countries listed the Migration and Remittances Factbook comprises the sample of the paper. The raw data are from the World Development Indicators online.

Complete information is required to compile a dataset spanning the period 1984 to 2008. The countries are grouped into three according to income categories to control for the differences in their levels of development and standards of living. Separate regressions are performed for each income group.

3. Who gets Dutch disease?

The primary diagnosis is: Dutch disease caused by international remittances is more of a developing country problem than an upper income country problem (Table 1). Moreover, the results indicate that low income countries suffer more than the middle income countries because the production structures in the former are relatively weaker. Low countries are thus easily hit by this strain of the disease. The diagnosis actually supports the oft repeated mantra that industrialization is vital to avoid an economic decline. In addition, the results indicate that upper income countries do not suffer from Dutch disease caused by international remittances presumably because their case is more of a function of the level of development. In other words, the declines in their tradable sectors are caused by economic maturation that gives rise to de-industrialization.[3]

Table 1: *Summary of results, in percent (%)*

	Upper income	Middle income	Low income
Remittance		-3.66	-12.01
Remittance, lagged			-4.85
Monetary policy	6.30	0.03	
Exchange rate policy	-5.52	-1.71	-1.39
Trade policy	5.24	2.59	5.76
Labor capacity	-1.37		
Industrial capacity	1.43	-0.78	-4.34
Financial capacity	-1.32		1.86

Note: The reported indicators are statistically significant at 5%, except for lagged remittance of low income countries that is significant at 10%. See Appendix for details of the results.

The secondary diagnoses deal with the macroeconomy and structural change indicators. The total impact

[3] See Palma (2005) for a similar view.

of the macroeconomic indicators is enough to at least ameliorate the impact of the Dutch disease (Table 1). Results for all income groups show that fiscal policy is statistically insignificant in affected the tradable sector. But the other macroeconomy policy indicators can be useful tools. Perhaps the problem with fiscal policy is choosing the appropriate indicator. Other proxies like budget deficit or tax revenues also do not give useful results. To some extent, these results for the developing countries are expected because the public sectors there are typically not as strong as the public sectors in upper income countries. In any case, the findings are still useful because they may be interpreted to suggest that the private sector needs to play a bigger role in the economy. If so, there is a role for public-private sectors partnerships in the economy.

Monetary policy indicators of the developing countries turn out to be not statistically significant. In the upper income countries, where (quasi) inflation targeting is in place, the results indicate that restrictive monetary policy facilitates the shifts in production away from the tradable sector. Interestingly, this finding confirms the disutility of (quasi) inflation targeting in the upper income countries. What this finding also indicates is that relaxing monetary policy to allow for more inflation might be helpful to the tradable sector.

Currency appreciation undermines the tradable sector in both the developing and upper income countries. This finding means that having an appropriate international reserves management policy is of critical importance to a vigorous industrialization and technological upgrading program. Put another way, exchange rate policy is an essential tool for development.

Importation can potentially help prevent or even reverse Dutch disease. In both the developing and upper income countries, the results indicate that importation complement and/or support the tradable sector. These findings invalidate the concerns about importation hurting domestic production. Actually, such concerns if valid are most problematic in the low income countries where the production structures are

not yet well developed. Middle income countries can face such problems if importation competes with home-grown industrialization. However, it is interesting to find that the coefficient on importation in the low income countries turn out to be as large as that of the upper income countries. Perhaps catching up on the economic ladder is not implausible.

The structural change indicators present more interesting results. For instance, improvements in labor capacity are needed in the upper income countries to maintain their positions in the international market. Not much can be said for the developing countries, although conceptually raising labor capacity is needed to launch industrialization there. Labor released from sectoral production then creates a pool of workers that dampens wage increases or, at least, guarantees sufficient labor supply to sustain industrial deepening. Thus the important issue is not about how labor is mobilized but the manner in which labor gets absorbed into the production sectors.

Shifts in the configuration of economic production occur as there are shifts in the key production sectors. The developing countries appear to conform to this mode. The shifts in production sectors allow the developing countries to move from the interior of their production possibilities to the frontier. Of course, this process needs to accelerate with productivity increases. As the developing countries move to the frontier, more production happens and induces further reallocation of resources to improve the quality of production. For the upper income countries, on the other hand, results suggest that there is a need for rapid discovery and innovations. Put simply, being on the production possibilities demands extending, rather than regressing, the frontier.

The results indicate that greater financial capacity empowers the tradable sector. As production in the developing countries expands and industrialization begins to set in, the resulting greater demand for financial intermediation strengthens any complementarity between the financial and tradable sectors. In the process, industrial deepening is hastened. For the upper income countries, results show the reverse

trend. Perhaps this finding points to how financialization in the upper income countries has already transformed financial intermediation from a mechanism that supports economic production in general to an instrument for assets accumulation in particular.

4. Conclusion

The paper examines Dutch disease in the context of international remittances. The main diagnosis is that developing countries are susceptible to that strain of the disease but the upper income countries are not. For the upper income countries, Dutch disease, if it hits them, is associated with economic maturation.

The secondary diagnoses point out that both the macroeconomy and structural change indicators can be preventive measures against or remedies for the disease. For developing countries, competitive exchange rates and trade openness can be strong stimuli to their tradable sector. Improvements in labor and industrial capacities and financial deepening can also strengthen industrialization and facilitate technological upgrading. Indeed, the total impact of the macroeconomic indicators is enough to at least ameliorate the impact of the disease.

Dutch disease caused by international remittance is a preventable and curable ailment. To the extent that the macroeconomy settings help shape the character of economic production, progress can thus be made more deliberate. And to the extent that structural changes affect economic production, industrialization can thus be taken up more strategically. In view of the findings, the developing countries can get inoculated from getting the disease if they exercise vigilance and ensure the stability of economic production using appropriate policies. If they get infected they must act with due haste to prevent the disease from crippling their tradable sectors. Simply put, those who are able to manage the changes brought about by international remittances are also able to move up the industrialization ladder, whereas those that fail could get stuck in low-level development or, worse, fall down from the economic ladder.

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Appendix

Details of the regressions

Dependent: log(Share of Tradable Sector)	Upper Income	Middle Income *Run 1*	Middle Income *Run 2*	Low Income *Run 1*	Low Income *Run 2*	Low Income *Run 3*
Constant	0.0011*	-0.0045**	-0.0041*	-0.0052***	-0.0047***	-0.0046***
Remittances	-0.0388	-0.0366***	-0.0342***	-0.1276***	-0.1275***	-0.1201***
Int'l. Remittances lagged-1			-0.0117		-0.0557***	-0.0485*
Int'l. Remittances lagged-2						0.0036
Macroeconomy indicators:						
Government expenditure	-0.0059	-0.0092	-0.0085	-0.0043	-0.0045	-0.0091
Inflation	0.0630***	0.0003***	0.0003***	-0.0050	-0.0088	-0.0091
International Reserves	-0.0552***	-0.0171***	-0.0168***	-0.0185***	-0.0150**	-0.0139**
Imports of goods and services	0.0524***	0.0259***	0.0254***	0.0437***	0.0627***	0.0576***
Structural change indicators:						
Labor capacity	-0.0137***	0.0003	0.0003	0.0004	0.0002	0.0003
Industrial capacity	0.0143	-0.0078**	-0.0079**	-0.0453***	-0.0426***	-0.0434***
Financial capacity	-0.0132***	-0.0003	-0.0000	0.0268***	0.0177***	0.0186***
Adj. R^2	0.6840	0.2509	0.2545	0.7046	0.7180	0.7073

Notes: Tests reject the hypothesis of non-stationary variables and also the hypothesis that two or more of the variables are cointegrated. Lagged international remittances of the upper income countries are statistically insignificant. The lagging of the international remittances for middle and low income countries is done until the indicator turns statistically insignificant. Coefficients are to be multiplied by 100 to obtain growth rates in percent, as reported in Table 1. Significance levels: *** = very significant ($\alpha = 0.01$), ** = highly significant ($\alpha = 0.05$), * = significant ($\alpha = 0.10$).

Definition:

"Upper income" is comprised of Australia, France, Germany, Portugal, Spain, United Kingdom, and United States. The grouping follows the World Bank's classification of countries.

"Middle income" is comprised of Brazil, Colombia, Dominican Republic, Egypt, El Salvador, Guatemala, Mexico, Morocco, and Philippines. The grouping follows the World Bank's classification of countries.

"Low income" is comprised of Bangladesh, China, India, and Pakistan. The grouping follows the World Bank's classification of countries.